WHAT IS CLAIMED IS:

1. A power conversion apparatus comprising:

a power switching device;

a voltage sensor which detects an output voltage of said switching device to output a first signal depending on the output voltage;

a current sensor which detects an output current of said switching device to output a second signal depending on the output current; and

a device controller connected to said switching device, said voltage sensor, and said current sensor;

wherein said device controller includes:

a driver connected to said switching device; and

a correcter connected to said driver, said voltage sensor and said current sensor;

said driver outputs a third drive signal to said switching device; and

said correcter

obtains the first signal from said voltage sensor, the second signal from said current sensor, and the third signal from said driver;

calculates a switching loss by using a value of the first signal and a value of the second signal;

compares a value of the switching loss with a first reference value, and the value of the first signal with a

second reference value; and

corrects the value of the third signal, when at least one of a condition in which the value of the switching loss exceeds the first reference value and a condition in which the value of the first signal exceeds the second reference value is satisfied, such that the exceeding value is not larger than the corresponding reference value.

2. The power conversion apparatus according to claim 1, wherein said driver comprises:

a variable resistor connected to said switching device; and

a resistor controller connected to said variable resister;

wherein said correcter outputs a fourth signal to said resistor controller, representing a first resistance value to be employed by said variable resister;

said resistor controller changes the resistance value of said variable resistor based on the fourth signal such that the resistance value of said variable resistor is equal to the first resistance value; and

said variable resistor applies a voltage depending on the resistance value thereof to a control terminal of said switching device.

3. The power conversion apparatus according to claim 1, wherein said driver comprises:

a transistor connected to said switching device;

a transistor driver connected to said transistor;

wherein said correcter outputs a fourth signal to said transistor driver, representing a value of a fifth signal to be output by said transistor driver to said transistor;

said transistor driver outputs the fifth signal having the value represented by the fourth signal to a control terminal of said transistor; and

said transistor outputs a current depending on the fifth signal to a control terminal of said switching device.

4. The power conversion apparatus according to claim 1, wherein said driver comprises:

a plurality of transistors connected to said switching device, and connected in parallel to each other; and

a transistor driver connected to said plurality of transistors;

wherein said correcter outputs a fourth signal to said transistor driver, representing the number of transistors to which a fifth signal is to be output by said transistor driver;

said transistor driver outputs the fifth signal to at least one of said plurality of transistors number of which

is represented by the fourth signal;

said transistor, to which the fifth signal is output, outputs a current to a control terminal of said switching device.

5. The power conversion apparatus according to claim 1, wherein said correcter obtains the first signal, the second signal, and the third signal as a sixth correction input signal at a leading edge and a trailing edge of the third signal,

said correcter corrects, at the leading edge of the third signal, the value of the third signal on the basis of the sixth signal obtained at another leading edge, and corrects, at the trailing edge of the third signal, the value of the third signal on the basis of the sixth signal obtained at another trailing edge; and

said another leading edge is a first predetermined number of the leading edges previous to the leading edge of the third signal at which said correcter corrects the value of the third signal, and said another trailing edge is a second predetermined number of the trailing edges previous to the trailing edge of the third signal at which said correcter corrects the value of the third signal.

6. The power conversion apparatus according to claim

1, wherein said correcter obtains the first signal, the second signal, and the third signal as a sixth correction input signal at a first leading edge of the third signal after said power conversion apparatus is started, and corrects, at all the subsequent leading edges of the third signal, the value of the third signal on the basis of the sixth signal obtained at the first leading edge; and

said correcter obtains the sixth signal at a first trailing edge of the third signal after said power conversion apparatus is started, and corrects, at all the subsequent trailing edges of the third signal, the value of the third signal on the basis of the sixth signal obtained at the first trailing edge.

7. A power conversion apparatus comprising;

a power switching device;

a state sensor which detects a drive state of said switching device to output a first signal depending on the drive state; and

a temperature sensor which detects a temperature of said switching device to output a second signal depending on the temperature; and

a device controller connected to said switching device, said state sensor and said temperature sensor;

wherein said device controller includes:

a protecter connected to said state sensor;

a correcter connected to said state sensor, said temperature sensor, and said protecter;

wherein said correcter obtains the first signal from said state sensor and the second signal from said temperature sensor to set a third reference value depending on the second signal, and outputs a third signal representing the third reference value to said protecter;

said protecter obtains the first signal from said state sensor, and compares the value of the first signal with the third reference value to output a fourth signal based on the comparison result.

8. The power conversion apparatus according to claim 7, wherein said protecter comprises:

a plurality of resistors connected in series which divides a reference voltage;

a selecter connected to said plurality of resistors,

a comparator connected to said selecter; wherein said selecter obtains the third signal, and selects at least one of said plurality of resistors to generate a comparison voltage by using the selected at least one of said plurality of resistors and the reference voltage such that the comparison voltage is equal to the third reference value; and

said comparator compares the value of the first signal with the comparison voltage.

9. The power conversion apparatus according to claim 7, wherein said correcter obtains the first signal at a leading edge and a trailing edge of a fifth drive signal output to said switching device; and

said correcter corrects, at the leading edge of the fifth signal, the reference value on the basis of the first signal obtained at another leading edge, and corrects, at the trailing edge of the fifth signal, the reference value on the basis of the first signal obtained at another trailing edge; and

said another leading edge is a first predetermined number of the leading edges previous to the leading edge of the fifth signal at which said correcter corrects the reference value, and said another trailing edge is a second predetermined number of the trailing edges previous to the trailing edge of the fifth signal at which said correcter corrects the reference value.

10. The power conversion apparatus according to claim 7, wherein said correcter obtains the first signal at a first leading edge of fifth drive signal output to said switching device after said power conversion apparatus is

started, and corrects, at all the subsequent leading edges of the fifth signal, the reference value on the basis of the first signal obtained at the first leading edge, and

said correcter obtains the first signal at a first trailing edge of the fifth signal after said power conversion apparatus is started, and corrects, at all the subsequent trailing edges of the fifth signal, the reference value on the basis of the first signal obtained at the first trailing edge.

11. The power conversion apparatus according to claim 2, wherein said correcter comprises a storage circuit which stores the fourth signal.

12. The power conversion apparatus according to claim 3, wherein said correcter comprises a storage circuit which stores the fourth signal.

13. The power conversion apparatus according to claim 4, wherein said correcter comprises a storage circuit which stores the fourth signal.

14. The power conversion apparatus according to claim 7, wherein said correcter comprises a storage circuit which stores the third signal.

15. The power conversion apparatus according to claim 8, wherein said correcter comprises a storage circuit which stores the third signal.

16. The power conversion apparatus according to claim 1, wherein said device controller comprises a level-shifter which exchanges signals between said device controller and a controller which controls said power conversion apparatus.

17. The power conversion apparatus according to claim 7, wherein said device controller comprises a level-shifter which exchanges signals between said device controller and a controller which controls said power conversion apparatus.

18. A power conversion system comprising:

at least one power conversion apparatus for an upper arm including

a power switching device;

a voltage sensor which detects an output voltage of said switching device to output a first signal depending on the output voltage;

a current sensor which detects an output current of said switching device to output a second signal depending on the output current; and

a device controller connected to said switching device, said voltage sensor, and said current sensor;

wherein said device controller includes:

a driver connected to said switching device; and

a correcter connected to said driver, said voltage sensor and said current sensor;

said driver outputs a third drive signal to said switching device; and

said correcter

obtains the first signal from said voltage sensor, the second signal from said current sensor, and the third signal from said driver;

calculates a switching loss by using a value of the first signal and a value of the second signal;

compares a value of the switching loss with a first reference value, and the value of the first signal with a second reference value; and

corrects the value of the third signal, when at least one of a condition in which the value of the switching loss exceeds the first reference value and a condition in which the value of the first signal exceeds the second reference value is satisfied, such that the exceeding value is not larger than the corresponding reference value; and

at least one power conversion apparatus for a lower arm including

a power switching device;

a voltage sensor which detects an output voltage of said switching device to output a first signal depending on the output voltage;

a current sensor which detects an output current of said switching device to output a second signal depending on the output current; and

a device controller connected to said switching device, said voltage sensor, and said current sensor;

wherein said device controller includes:

a driver connected to said switching device; and

a correcter connected to said driver, said voltage sensor and said current sensor;

said driver outputs a third drive signal to said switching device; and

said correcter

obtains the first signal from said voltage sensor, the second signal from said current sensor, and the third signal from said driver;

calculates a switching loss by using a value of the first signal and a value of the second signal;

compares a value of the switching loss with a first reference value, and the value of the first signal with a second reference value; and

corrects the value of the third signal, when at

least one of a condition in which the value of the switching loss exceeds the first reference value and a condition in which the value of the first signal exceeds the second reference value is satisfied, such that the exceeding value is not larger than the corresponding reference value.

19. A method for correcting a drive signal output to a power switching device, comprising the steps of:

obtaining a first signal depending on an output voltage of said switching device, a second signal depending on an output current of said switching device, and a third drive signal output to said power switching device;

calculating a switching loss by using a value of the first signal and a value of the second signal;

comparing a value of the switching loss with a first reference value, and the value of the first signal with a second reference value; and

correcting the value of the third drive signal, when at least one of a condition in which the value of the switching loss exceeds the first reference value and a condition in which the value of the first signal exceeds the second reference value is satisfied, such that the exceeding value is not larger than the corresponding reference value.